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25 SEP 200325SEP03 083946-1 002950  
F01/7700 0.00-0322478.9

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

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1. Your reference

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2. Patent application number

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0322478.9

25 SEP 2003

3. Full name, address and postcode of the or of each applicant (underline all surnames)

ARTJANG AGAHORANG AGAHMOAT HOUSE  
16 DONGORE HILL72 DERAMORE PARK SOUTH  
BELFAST

Patents ADP number (if you know it)

MUCKAMORE  
COUNTY ANTRIM  
NORTHERN IRELAND  
BT41 2HWNORTHERN IRELAND  
BT9

If the applicant is a corporate body, give the country/state of its incorporation

853/311001

4. Title of the invention

COVER DEVICE FOR A MEDICAL INSTRUMENT AND  
APPARATUS FOR DISPENSING SAME

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom  
to which all correspondence should be sent  
(including the postcode)

ALAN WALLACE

4 MOUNT CHARLES

BELFAST

BT7 1NZ

Patents ADP number (if you know it)

8676116001

6. Priority: Complete this section if you are declaring priority from one or more earlier patent applications, filed in the last 12 months.

Country

Priority application number  
(if you know it)Date of filing  
(day / month / year)

7. Divisionals, etc: Complete this section only if this application is a divisional application or resulted from an entitlement dispute (see note f)

Number of earlier UK application

Date of filing  
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Answer YES if:

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

Otherwise answer NO (See note d)

NO

Patents Form 1/77

## Patents Form 1/77

9. Accompanying documents: A patent application must include a description of the invention. Not counting duplicates, please enter the number of pages of each item accompanying this form:

Continuation sheets of this form ☐

Description 13

Claim(s) ☐Abstract ☐

Drawing(s) 4 only

10. If you are also filing any of the following, state how many against each item.

Priority documents ☐Translations of priority documents ☐Statement of inventorship and right to grant of a patent (Patents Form 7/77) ☐Request for a preliminary examination and search (Patents Form 9/77) ☐Request for a substantive examination (Patents Form 10/77) ☐Any other documents (please specify) ☐

11. I/we request the grant of a patent on the basis of this application.

Signature(s) *Alan Wallace*

Date 25/9/03

12. Name, daytime telephone number and e-mail address, if any, of person to contact in the United Kingdom

ALAN WALLACE 02890 236000

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COVER DEVICE FOR A MEDICAL INSTRUMENT AND APPARATUS FOR  
DISPENSING SAME

FIELD OF THE INVENTION

5

One aspect of the present invention relates to a cover device for an instrument particularly, but not exclusively, a medical instrument such as a stethoscope. Another aspect of the invention relates to an apparatus for dispensing cover devices, especially medical instrument cover devices.

BACKGROUND TO THE INVENTION

15 A person's body harbours various types of bacteria and other micro-organisms many of which are infectious. The use of a medical instrument, and in particular a stethoscope, on more than one patient can cause cross-contamination of patients. This is a particular concern in cases where the instrument comes into contact with blood.

25 It is good practice to clean the instrument between patients but often cleaning is not thoroughly performed, or is not performed at all.

To address this problem, it is known to provide a protective cover for stethoscopes. For example, US patent US 5,365,023 (Lawton) discloses a stethoscope cover comprising an elastic membrane with a rolled rim. In use the rim is stretched over the head of the stethoscope and the membrane is held in place by its elastic resilience. US patent US 5,813,992 (Henwood)

discloses a bag-type stethoscope cover which, in use, encases the entire stethoscope head.

Both of these known covers are considered to be  
5 cumbersome to fit onto and to remove from the stethoscope head.

It would be desirable therefore to provide a cover for protecting the head of a medical instrument,  
10 particularly a stethoscope, which is relatively simple to fit and remove.

#### SUMMARY OF THE INVENTION

15 Accordingly, a first aspect of the invention provides an apparatus for dispensing a cover device, the cover device comprising a membrane seated on a frame, the apparatus comprising: a magazine for storing one or more cover device, the magazine having a mouth through  
20 which the or each cover device may be dispensed; an actuating mechanism arranged to urge the or each cover device towards the mouth; and means for dislodging the membrane from its seating on the frame, wherein said dislodging means is arranged to dislodge the membrane  
25 from the cover device adjacent the magazine mouth upon movement of said cover device away from the mouth.

Preferably, a retaining lip is provided around at least part of the dispensing mouth.

30

Preferably, said dislodging means comprises one of

the wall of the magazine in a direction towards the mouth. Preferably, said projections are formed from a flexible resilient material.

- 5 Preferably, said actuating mechanism comprises a platform mounted on a spring, the spring being biased to urge the platform towards the mouth.

- 10 A second aspect of the invention provides a cover device, the cover device comprising a frame and a membrane, wherein, in an unfitted state, the periphery of the membrane is seated around the outer periphery of the frame and, in a fitted state, the outer periphery of the membrane is dislodged from its seat so that the  
15 membrane embraces the frame.

- Preferably, the outer periphery of the membrane comprises an outer peripheral ring. More preferably, the outer periphery of the frame is concave in cross-  
20 sectional profile to define a seat for the outer peripheral ring.

- Preferably, the membrane is formed from resilient, elastic material.

25

A third aspect of the invention provides a dispensing system comprising said dispensing apparatus and one or more cover devices.

- 30 Further advantageous aspects of the invention will become apparent to those ordinarily skilled in the art upon review of the following description of a specific

Figure 8 presents a cut-away perspective view of part of the dispensing apparatus of Figure 7.

## 5 DETAILED DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention is now described with reference to Figures 1 to 8. The following description is made in the context of  
10 stethoscopes although it will be understood that the invention is not limited to stethoscopes and may alternatively be adapted for use with other medical instruments.

15 Stethoscopes are well known and normally include a head comprising one or more acoustic transponders. Figures 1 and 3 best illustrate a typical stethoscope head 10 comprising a first acoustic transponder in the form of a cup or cone portion 12 the mouth of which is covered  
20 by a diaphragm 14. Such acoustic transponders are commonly referred to as diaphragm transponders. The head 10 also comprises a second acoustic transponder in the form of an open-mouthed bell 16. Such acoustic transponders are commonly referred to as bell  
25 transponders. The diaphragm transponder 12 is more commonly used than the bell transponder and it is therefore considered to be of primary importance to provide a cover for the diaphragm transponder 12. Moreover, since, during use, it is the exterior surface  
30 15 of the diaphragm 14 which comes into contact with a patient, it is considered to be particularly important

Referring now to Figures 1 and 2, there is shown, generally indicated at 20, an apparatus for dispensing one or more cover devices 50 which are particularly suited for protecting the diaphragm transponder 12 and, more particularly, the exterior surface 15 of the diaphragm 14. In Figure 1, a cover device 50 is shown fitted to the diaphragm transponder 12 of the stethoscope head 10.

Each cover device 50 comprises a frame 52 for carrying a membrane 54. The membrane 54 may be formed from any suitable rubber or plastics material and is preferably flexible and resilient, or elastic. Moreover, the membrane material is advantageously selected so as to minimise acoustic attenuation while presenting a barrier to micro-organisms and other contaminants. For example, the membrane 54 may be formed from latex or silicone, or similar material, and may be approximately 0.1 - 0.2 mm in thickness.

20

The frame 52 is formed from substantially rigid, or semi-rigid material, such as plastics or a paper or card based material. The frame 52 is a self-supporting structure which serves to hold the membrane 54 in a deployed state in which, when the membrane 54 is formed from flexible resilient material, the membrane 54 is held substantially taut by the frame 52.

The frame 52 is shaped and dimensioned to fit the instrument to which it is intended to be fitted. In the illustrated embodiment, the frame 52 is shaped and dimensioned to fit the diaphragm transponder 12 of the stethoscope head 10, and more particularly to fit over



the transponder 12 such that the exterior surface 15 of the diaphragm 14 is covered by the membrane 54. Hence, the frame 52 comprises a generally circular ring. It will be understood that the frame 52 may alternatively  
5 take other shapes and dimensions to suit the particular instrument to which it is intended to be fitted.

The membrane 54 is self-retaining on the frame 52 by virtue of its resilience. To help retain the membrane  
10 54 on the frame 52, the membrane 54 is preferably provided with a peripheral ring 56 formed from elastic or resilient material (typically from the same material as the membrane 54). The peripheral ring 56 may be co-  
15 formed with the membrane 54 in any suitable manner and may, for example, be formed by rolling the peripheral portion of the membrane 54, or by injection moulding. In the illustrated embodiment, the peripheral ring 56 is generally circular in shape and has a diameter less than that of the frame 52 so that the membrane 54 must  
20 be stretched to be fitted over the frame 52. When fitted on the frame 52, the membrane 54 covers the mouth defined by one face of the frame 52 leaving an open mouth 58 at the other face of the frame 52.

25 The outer periphery of the frame 52 is shaped to define a seat 60 for the peripheral ring 56 of the membrane 54. To this end, the outer side 62 of the frame 52 is advantageously shaped in a manner which corresponds with the profile of the peripheral ring 56. In the  
30 preferred embodiment, the peripheral ring 56 is of substantially circular cross-section and the outer face

side 62 of the frame 52 is concave. Advantageously, the outer side 62 of the frame 52 is shaped to define a first peripheral lip 64 which runs around the periphery of the frame 52 and which is located at or adjacent the face of the frame 52 which defines the open mouth 58. The outer side 62 is also shaped to define a second peripheral lip 66 which runs around the periphery of the frame 52 and which is located at or adjacent the opposite face of the frame 52. The second lip 66 is advantageously larger than the first lip 64, i.e. it protrudes farther from the outer side 62 than does the first lip 64. In an unfitted state, the peripheral ring 56 is seated in the seat 60 as shown in Figures 2 to 6.

Referring now in particular to Figure 2, the dispensing apparatus 20, or dispenser, comprises a chamber, or magazine 22, for storing one or more cover devices 50. The magazine 22 is shaped to define a dispensing mouth 24. A lip 26 is provided at the mouth 24 and extends inwardly of the mouth 24. Preferably, the lip 26 extends around the entire periphery of the mouth 24.

The dispenser 20 also includes dislodging means conveniently in the form of one or more projections 32. In the illustrated embodiment, the dispenser 20 comprises three projections 32 (only two visible) spaced-apart around the periphery of the dispenser 20. As may best be viewed in Figures 4 and 6, the projections 32 extend obliquely from the interior wall of the magazine 22 in a direction towards the mouth 24. The projections 32 are dimensioned so that they may interfere with the cover devices 50 within the magazine

22. The projections 32 are located adjacent and beneath the mouth 24 of the magazine 22 so that they may interfere only with the topmost cover device 50' as is described in more detail below.

5

In the drawings, the projections are shown in a rest state in which the respective free end 34 of each projection 32 lies beneath the topmost cover device 50'. In this state, movement of the topmost cover  
10 device 50' would cause the peripheral ring 56 to engage with the free ends 34 of the projections 32. The projections 32 are pivotable with respect to the magazine 22 so that they may be pushed out of the rest state towards the walls of the magazine 22. To this  
15 end, the projections 32 are preferably formed from a flexible plastics material. Conveniently, the projections are co-formed with a carrier ring 36 which is seated on a shoulder 38 formed in the interior wall of the magazine 22. Alternatively, the projections 32  
20 may be integrally formed with the magazine 22. The projections 32 are resiliently biased to adopt the rest state.

When stored in the magazine 22, the cover devices 50  
25 are stacked one on top of the other in a substantially concentric manner. The cover devices 50 are disposed in a respective plane which is substantially parallel with the plane of the mouth 24 of the dispenser 20.

Conveniently, at least the interior walls of the  
30 magazine 22 are shaped substantially to match the shape of the flanges 32 when convenient. ~~respective~~

10

The dispenser 20 further comprises an actuating mechanism for pushing the cover devices 50 towards the mouth 24 of the dispenser. The actuating mechanism  
5 comprises a platform 28 located within the magazine and mounted on a spring 30, for example a compression spring, biased to urge the platform 28 towards the mouth 24. The illustrated actuating mechanism 28, 30  
10 is therefore piston-like in form although it will be understood that it may take a variety of alternative forms.

In use, a stack of one or more cover devices 50 rests on the platform 28 and is urged towards the mouth 24 of  
15 the dispenser 20 under the action of the spring 30. The topmost cover device 50' in the stack, i.e. the cover device 50 nearest to the mouth 24, is prevented from exiting the dispenser 20 via the mouth 24 by engagement with the lip 26. In particular (and as may  
20 best be seen from Figure 4) the peripheral ring 56 of the membrane 54 engages with the lip 26 such that the topmost cover device 50' is held in the mouth 24 of the dispenser 20 as shown in Figure 2. The cover devices 50 are arranged so that their respective open mouth 58  
25 is exposed by, or is accessible via, the mouth 24 of the dispenser 20 when they reach the topmost position.

The operation of the dispenser 20 is now described with reference in particular to Figures 3 to 8. For reasons  
30 of clarity, the entire stack of cover devices 50 is not shown in Figures 3 to 8. Figure 3 shows an uncovered stethoscope head 10 approaching the open mouth 24 of the dispenser 20. The topmost cover device 50' is

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located in the mouth 24 of the dispenser 20 as described above. A user (not shown) pushes the stethoscope head 10 into the open mouth 24 of the dispenser 20 so that the transponder 12 fits into the open mouth 58 of the topmost cover device 50' (see Figures 5 and 6).

As the user continues to push the stethoscope head 10 into the dispenser 20, the diaphragm 14 engages with the membrane 24 causing the topmost cover device 50' to be pushed into the dispenser 20 against the bias of the spring 30 (the entire stack of cover devices 50 is pushed downwardly as viewed in Figure 2). As the topmost cover device 52 moves downwardly (as viewed in Figure 5), the peripheral ring 56 engages with the respective free ends 34 of the dislodging projections 32. The projections 32 dislodge the peripheral ring 56 from its seat 60 on the frame 52 thereby pushing it over the first lip 64. This is facilitated by the fact that the first lip 64 is relatively short. Because the peripheral ring 56 is kept under tension, i.e. stretched, when carried by the frame 52, once it is dislodged by the projections 32, it contracts under its own resilience to embrace the transponder 12, as shown in Figures 7 and 8.

The cover device 50' is thus fitted to the stethoscope head 10. The user may then withdraw the stethoscope head 10 (with fitted cover 50) from the dispenser 20 (see Figure 1). The lip 26 does not interfere with the withdrawal of the head 10 since the vertical distance of

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is self-retaining on the stethoscope head 10 under the resilience of the membrane 54, and in particular the peripheral ring 56.

5 A fitted cover device 50 may easily be removed by pulling on the peripheral ring 56. Advantageously, one or more perforations (not shown) and/or one or more tabs (not shown) may be formed in the membrane 54 and peripheral ring 56 to facilitate removal.

10

Once the topmost cover device 50' has been dispensed, the next cover device 50 is pushed, under the action of the spring 30, into the topmost position. As the cover device 50 moves into the topmost position, it engages  
15 with the projections 32. The flexibility of the projections 32 and their oblique disposition allows them to be pushed towards the walls of the magazine 22 by the passing cover device 50. Once the cover device 50 has reached the topmost position, the projections 32  
20 adopt the rest state under their own resilience.

It will be appreciated from the foregoing that the invention provides means for quickly and easily  
25 dispensing covers for stethoscopes or other medical or non-medical instruments.

The embodiment described above relates to the diaphragm transponder 12 of a conventional stethoscope. In an  
30 alternative embodiment, not illustrated, the cover device and dispenser are arranged to be compatible with the bell transponder 16. In such an embodiment, it is advantageous for the membrane to comprise an aperture which, when fitted, is substantially in register with

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the open mouth, or aperture 17, of the bell transponder  
 16. Moreover, it will be understood that the invention  
 is not limited to use with stethoscopes. Alternative  
 embodiments of the invention may relate to the covering  
 5 of the whole or part of other medical instruments or  
 non-medical instruments.

The invention is not limited to the embodiments  
 described herein which may be modified or varied  
 10 without departing from the scope of the invention.

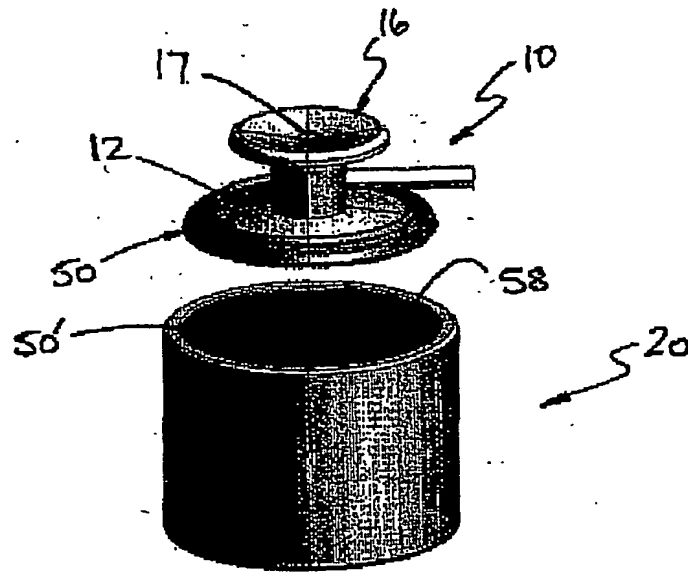


FIG. 1

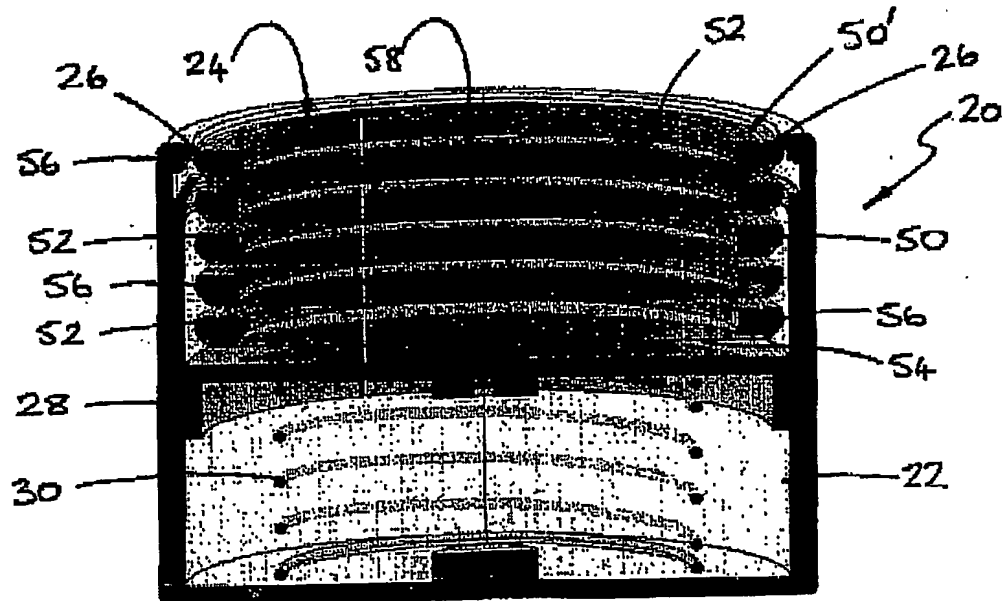
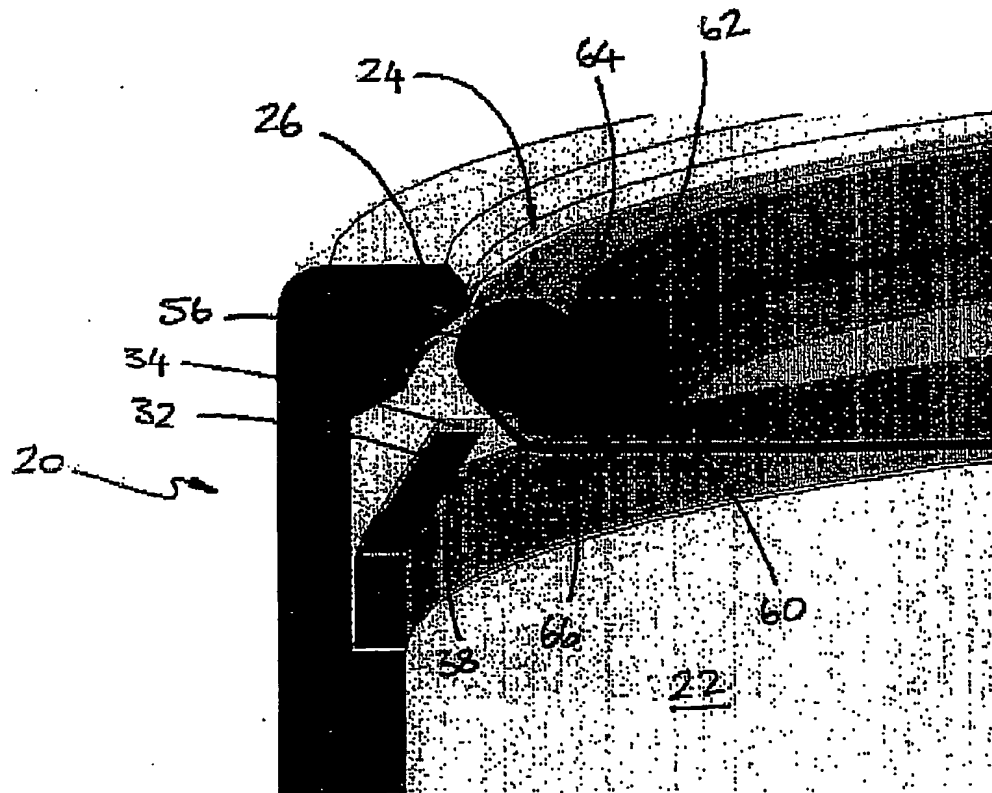
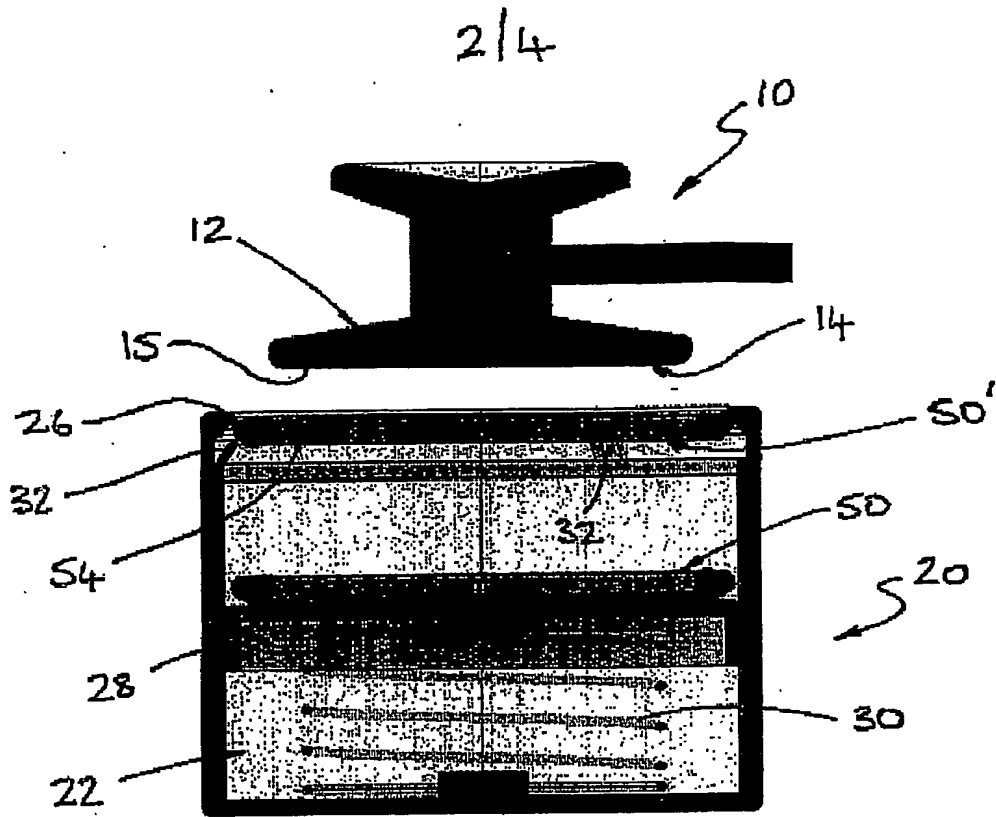


FIG. 2





3/4

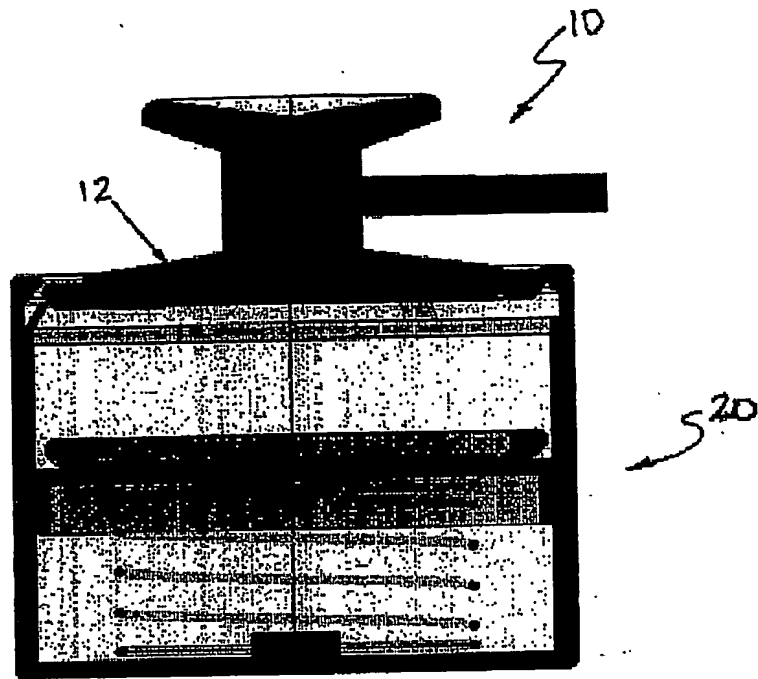


FIG. 5

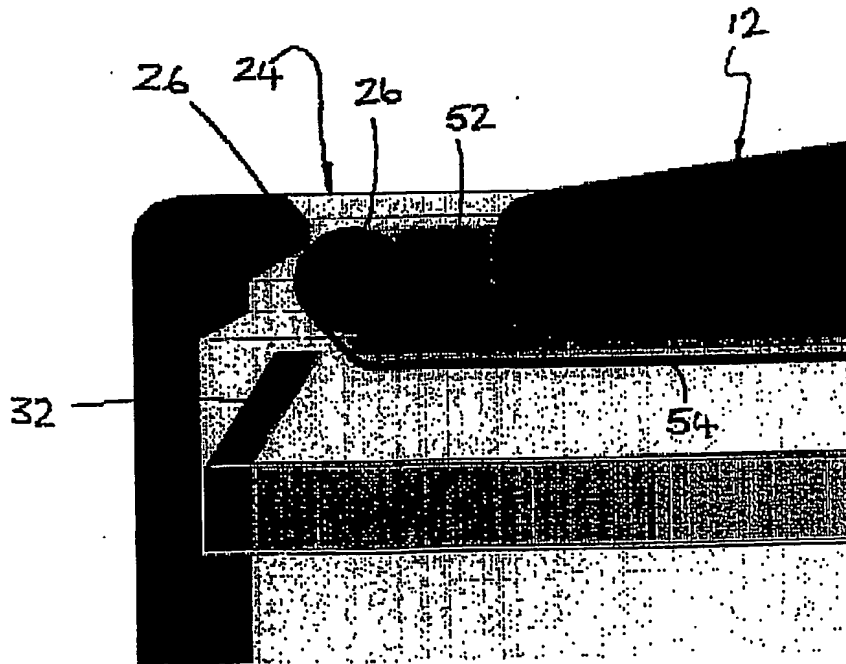


FIG. 6

4/4

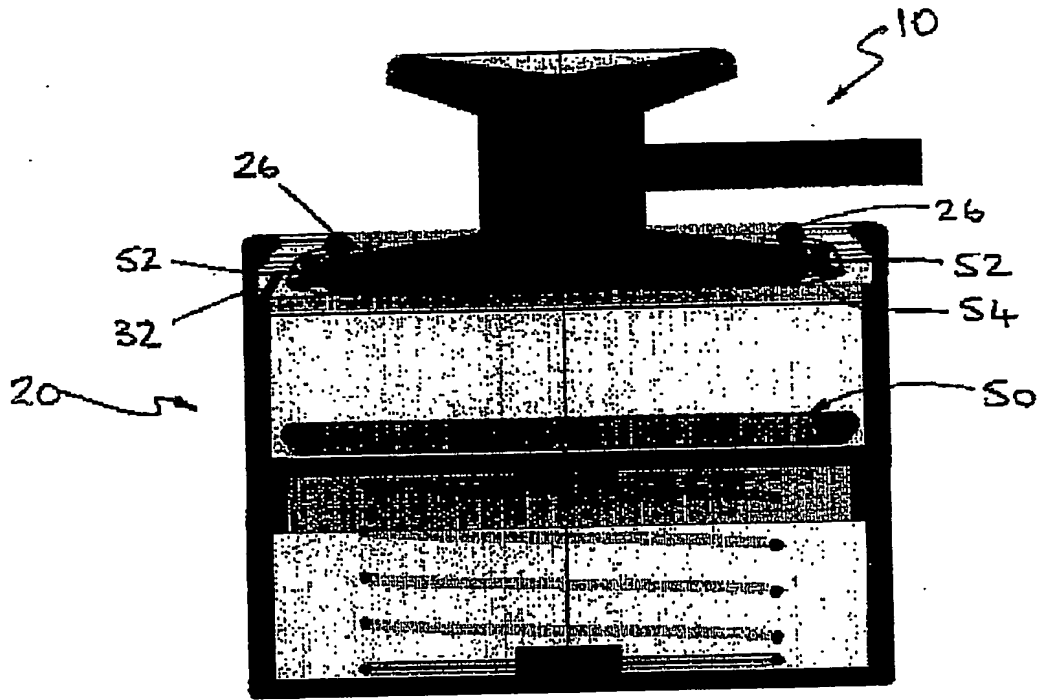


FIG. 7

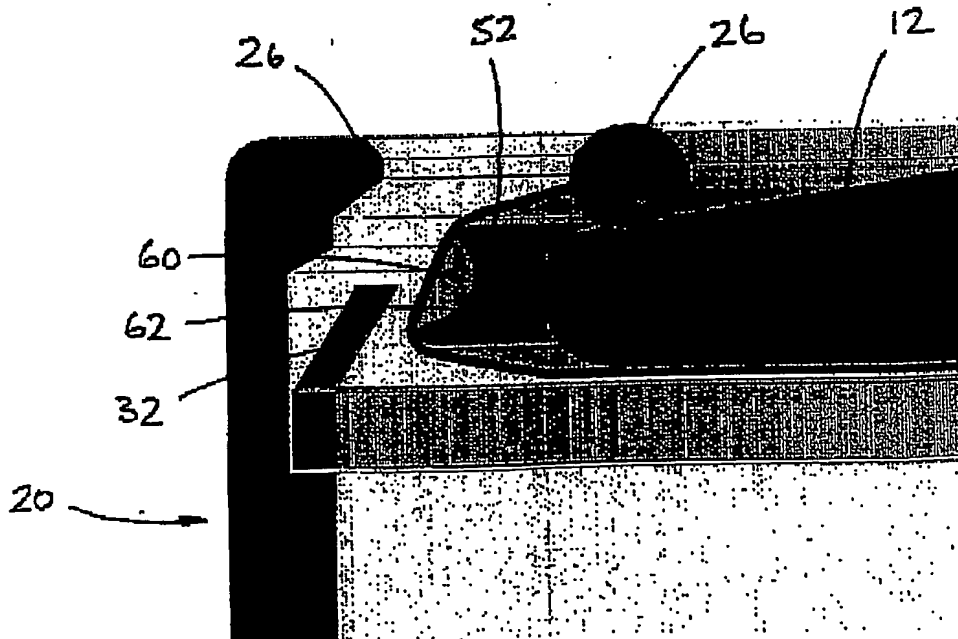


FIG. 8

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